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00304757.8-2109/1059372

Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire

TORAY INDUSTRIES, INC.

COMMUNICATION PURSUANT TO ARTICLE 115(2) EPC

Please find enclosed observations by a third party concerning the patentability of the invention of the above-mentioned patent application. That person is not a party to the proceedings before the EPO (Art. 115(1) EPC).

Under Article 115(2) EPC you may comment on the observations.


Corinne Le Bolloch
Formalities Officer

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15. August 2002

European patent application 00304757.8
European publication no. 1059372
Applicant: Toray Industries, Inc., Tokyo, Japan

Dear Sirs:

I write under the provisions of Article 115 of the European Patent Convention to draw attention to the disclosures of the enclosed prior art documents, copies of which are enclosed herewith.

For the reasons set out in the attachment to this letter ("Observations to EP 1059372 A2"), the subject-matter claimed in the claims as published lacks novelty and inventive step in the light of the disclosure of the enclosed prior art References.

17-08-2002

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PHYSICS

Copy of this book and its contents has been also to you

I submit that due to the reasons given herein the above-mentioned European patent application should be refused.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'E. Beul', written in a cursive style.

(Evelyn Beul)

Encls.

Attachment

1 copy of this brief and its enclosures for the applicant

Observation to EP 1059372 A2

1. EP 1059372 A2

Application No. 00304757.8 (Date of filing:
06.06.2000)

Priority: 08.06.1999 JP 16054899
08.08.1999 JP 23824099

2. Prior Arts:

GB 1,075,689 (Complete Specification Published:
July 12,1967)

US 3,671,379 (Patented: June 20,1972)

JP 11-50329 (Kokai) (Specification Published:
February 23,1999)

JP 5-295670 (Kokai) (Specification Published:
November 9,1993)

JP 8-337916 (Kokai) (Specification Published:
December 24,1996)

US 2,987,797 (Patented: June 13,1961)

In the case of the above prior arts, US 3,671,379 is a counterpart of GB 1,075,689.

3. Observation concerning the patentability of the invention of EP 1059372 A2

The present invention comprises a yarn, a method of producing the yarn and a fabric. However, the method of producing the yarn is the same as that disclosed in GB 1,075,689 or easily carried out by a person with ordinary skill in the art. Therefore, a yarn produced by the method is inevitably not patentable and a fabric made from the yarn is also not patentable.

The reason is described in detail, as follows.

(1) Concerning the method of producing the yarn

1) Claim 17 of EP 1059372 A2 is as follows.

"A method of producing a yarn which method is characterized in that a yarn of conjugate fibers comprising two types of polyester is spun at a take-up velocity of at least 1200 m/min, drawn at a drawing temperature of 50 to 80°C and heat set."

The constituent features of claim 17 are:

- (a) a yarn of conjugate fibers comprising two types of polyester,
- (b) spun at a take-up velocity of at least 1200 m/min,
- (c) drawn at a drawing temperature of 50 to 80°C,
- (d) heat set.

* Concerning the constituent feature (a)

GB 1,075,689 discloses in claim 1: "A helically crimpable composite filament comprising a laterally eccentric assembly of at least two synthetic polymeric components at least the first of which is a polyester." and in Example 12, a PPT polymer and PET polymer are used. There are some Examples in GB 1,075,689 which disclose many kinds of composite filaments comprising two types of polyester. Incidentally, a composite filament is also called a conjugate fiber, and PPT is also called PTT or poly(trimethylene terephthalate). As explained above, the constituent feature (a) is disclosed in GB 1,075,689.

* Concerning the constituent feature (b)

In the technical field concerning a method of producing a polyester fiber, a take-up velocity of at least 1200 m/min is well known. For example, Examples 1-2 of JP 11-50329 disclose a take-up velocity of 1450 m/min (see paragraph [0027]). It is apparent that the constituent feature (a) would be obvious to a person with ordinary skill in the art.

* Concerning the constituent feature (c)

GB 1,075,689 discloses that "the preferred drawing temperature for the composite filaments may vary between room

temperature and slightly elevated temperatures; for example, a temperature of about 100°C or somewhat higher may be used" (see page 5, lines 70 to 75). That is, a drawing temperature between room temperature and about 100°C is disclosed in GB 1,075,689. As explained above, the constituent feature (c) is disclosed in GB 1,075,689.

* Concerning the constituent feature (d)

GB 1,075,689 discloses that "the drawing and taut heat treatment may be coupled in a continuous process ..." (see page 5, lines 85 to 86). Moreover, in Table 8A on page 13 of GB 1,075,689, the annealing temperatures of 180°C and 185°C are disclosed. That is, a heat setting at 180°C or 185°C is carried out in GB 1,075,689. As explained above, the constituent feature (d) is disclosed in GB 1,075,689.

Therefore, claim 17 is not patentable.

2) The constituent feature of claim 18 of EP 1059372 A2 is that "the fibers are drawn at a draw ratio such that the drawn yarn tensile elongation is 20 to 45%". In Table 8A on page 13 of GB 1,075,689, the values 22% and 24% of a yarn elongation after drawing (draw ratio: 3.63 and 4.36) are disclosed. As explained above, the constituent feature of claim 18 is disclosed in GB 1,075,689.

Therefore, claim 18 is not patentable.

3) The constituent feature of claim 19 of EP 1059372 A2 is "direct spin draw method".

In the technical field concerning a method of producing a polyester fiber, a direct spin draw method is well known. For example, JP 8-337916 discloses a direct spin draw method for producing a latent crimp polyester fiber (see claim 1 and paragraph [0001]). It is apparent that the constituent feature of claim 19 would be obvious to a person with ordinary skill in the art.

Therefore, claim 19 is not patentable.

4) The constituent feature of claim 20 of

EP 1059372 A2 is "a 2-stage spinning and drawing method in which yarn is temporarily wound following the spinning and then drawn".

In the technical field concerning a method of producing a polyester fiber, a 2-stage spinning and drawing method in which yarn is temporarily wound following the spinning and then drawn is well known. For example, USP 2987797 cited on page 5, line 12 in GB 1,075,689 discloses a 2-stage spinning and drawing method. It is apparent that the constituent feature of claim 20 would be obvious to a person with ordinary skill in the art.

Therefore, claim 20 is not patentable.

5) The constituent feature of claim 21 of EP 1059372 A2 is "... spun from a spinneret and taken up at a take-up velocity of at least 4000 m/min by providing a non-contact heater between the spinneret and a godet roller".

6) The constituent feature of claim 22 of EP 1059372 A2 is "... spun at a take-up velocity of at least 5000 m/min".

In the technical field concerning a method of producing a polyester fiber, it is well known that the polyester fiber is spun from a spinneret and taken up at a take-up velocity of at least 4000 m/min or 5000 m/min by providing a non-contact heater between the spinneret and a godet roller. It is apparent that the constituent features of claims 21 and 22 would be obvious to a person with ordinary skill in the art.

Therefore, claims 21 and 22 are not patentable.

7) The constituent feature of claim 23 of EP 1059372 A2 is that "the spinning temperature is 250 to 280°C".

Examples XII and XV of GB 1,075,689 disclose the spinning temperatures of 250°C and 268°C (see Table 8A and Table 10). As explained above, the constituent feature of

claim 23 is disclosed in GB 1,075,689.

Therefore, claim 23 is not patentable.

8) The constituent feature of claim 24 of EP 1059372 A2 is that "the melt viscosity ratio of the two types polyester is from 1.05:1 to 5.00:1".

Example XI of GB 1,075,689 discloses "Two pairs of PPT polymers, the second (XI-b) having intrinsic viscosities of 1.4 and 0.8, and co-spun at 285°C" (see page 12, lines 7 to 11). In PPT polymer, the ratio 1.4:0.8 of an intrinsic viscosity is equal to the ratio 2.3:1 of a melt viscosity at 285°C.

Also, Example XIV of GB 1,075,689 discloses "a PPT polymer having 1.79 of intrinsic viscosity and a PET polymer having 29 of relative viscosity, and 295°C of spin temperature" (see page 15, Example XIV-e in Table 9). A ratio of 1.79 of intrinsic viscosity in a PPT polymer to 29 of relative viscosity in a PET polymer is equal to 2.4:1 of a melt viscosity ratio at 295°C.

As explained above, the values of melt viscosity ratio 2.3:1 and 2.4:1 are substantially disclosed in GB 1,075,689, that is, the constituent feature of claim 24 is disclosed in GB 1,075,689.

Therefore, claim 24 is not patentable.

9) The constituent feature of claim 25 of EP 1059372 A2 is that "the yarn has, following treatment, a stress at 50% yarn stretch of no more than 30×10^{-3} cN/dtex and, at the same time, a percentage recovery of at least 60%".

The constituent feature of claim 25 relates to a yarn obtained, not to a method of producing the yarn. That is, claim 25 does not specify a method, but a yarn properties obtained. As explained later concerning claim 1, the yarn according to the invention of EP 1059372 A2 is not patentable. Therefore, claim 25 is not patentable.

(2) Concerning the yarn and the fabric

As explained above, since a method of producing the yarn is the same as that disclosed in GB 1,075,689 or could be easily conceived of by a person with ordinary skill in the art, a yarn produced by the method is inevitably the same as that disclosed in GB 1,075,689 and a fabric made from the yarn is also the same.

The reason is described below in detail.

1) Claim 1 of EP 1059372 A2 is as follows.

"A yarn comprising polyester fibers, which yarn is characterized in that following a heat treatment in which the yarn is immersed in boiling water for 15 minutes and then subjected to a dry heat treatment at 180°C for 15 minutes, the yarn has a stress, at 50% yarn stretch, of no more than 30×10^{-3} cN/dtex and, at the same time, a percentage recovery of at least 60%."

The yarn according to claim 1 is produced by the method according to any one of claims 17 to 25. As explained above, since the method according to any one of claims 17 to 25 is the same as that disclosed in GB 1,075,689, the resultant yarn is also the same as that disclosed in GB 1,075,689. Therefore, all of the claims concerning a yarn are apparently not patentable.

The reasons for the above are as follows.

The constituent features of claim 1 are:

- (a) a polyester yarn has a stress, at 50% yarn stretch, of no more than 30×10^{-3} cN/dtex,
- (b) a percentage recovery of at least 60%.

* Concerning the constituent feature (a)

GB 1,075,689 discloses in claim 1 "A helically crimpable composite filament comprising a laterally eccentric assembly of at least two synthetic polymeric components at least the first of which is a polyester ...", and in

Table 8B of Example 12, that "PPT/PET yarn has 1.8 mg/denier of power" The value 1.8 mg/denier of power is equal to the value 1.6×10^{-3} cN/dtex of a stress at 50% yarn stretch. That is, the constituent feature (a) is disclosed in GB 1,075,689.

* Concerning the constituent feature (b)

GB 1,075,689 discloses in Table 8B a yarn having 91% of stretch recovery (see page 14). Therefore, the constituent feature (b) is disclosed in GB 1,075,689.

As explained above, the constituent features of claim 1 are disclosed in GB 1,075,689. Moreover, as explained above, since the yarn according to the invention of EP 1059372 A2 is produced by the method disclosed in GB 1,075,689, the yarn according to claim 1 is the same as that disclosed in GB 1,075,689.

Therefore, claim 1 is not patentable.

2.) The constituent feature of claim 2 of EP 1059372 A2 is that "the Uster unevenness is no more than 2.0%".

It would be obvious to a person with ordinary skill in the art that a fiber having no more than 2.0% of Uster unevenness is obtained by melt-spinning under ordinary conditions such as disclosed in GB 1,075,689. In the method of producing a yarn according to EP 1059372 A2, the range of the melt-spinning conditions such as spinning temperature and spinning speed is ordinary in the technical field concerning a method of producing a polyester fiber. Therefore, the Uster unevenness is inevitably no more than 2.0% in both EP 1059372 A2 and GB 1,075,689. Moreover, as explained above, since the yarn according to the invention of EP 1059372 A2 is produced by the same method as disclosed in GB 1,075,689, the yarn is inevitably the same as that obtained in GB 1,075,689. That is, the yarn according to claim 2 is disclosed in GB 1,075,689.

Therefore, claim 2 is not patentable.

3) The constituent feature of claim 3 of EP 1059372 A2 is that "the diameter of the crimp is no more than 250 μm ".

4) The constituent feature of claim 4 of EP 1059372 A2 is that "the diameter of the crimp is no more than 200 μm ".

In the method of producing a yarn according to EP 1059372 A2, the range of the producing conditions are ordinary in the technical field concerning a method of producing a polyester fiber. Moreover, as explained above, since the yarn according to the invention of EP 1059372 A2 is produced by the same method as disclosed in GB 1,075,689, the yarn is inevitably the same as that obtained in GB 1,075,689. Therefore, the diameter of the crimp is no more than 250 μm or no more than 200 μm in both EP 1059372 A2 and GB 1,075,689. That is, the yarns according to claims 3 and 4 are disclosed in GB 1,075,689.

Therefore, claims 3 and 4 are not patentable.

5) The constituent feature of claim 5 of EP 1059372 A2 is "a yarn having a strength of at least 2.2 cN/dtex and a shrinkage stress of at least 0.25 cN/dtex".

Example XII of GB 1,075,689 discloses "the yarn having 3.4 gpd of tenacity" (see page 13, Table 8A). The value 3.4 gpd of tenacity is equal to the value 3.0 cN/dtex of strength. Moreover, as explained above, since the yarn according to the invention of EP 1059372 A2 is produced by the method disclosed in GB 1,075,689, the yarn is inevitably the same as that disclosed in GB 1,075,689. That is, the yarn disclosed in GB 1,075,689 has a shrinkage stress of at least 0.25 cN/dtex. It is apparent that the constituent feature of claim 5 would be obvious to a person with ordinary skill in the art.

Therefore, claim 5 is not patentable.

6) The constituent feature of claim 6 of EP 1059372 A2 is "a crimp retention after stretching 10 times of at least

85%".

7) The constituent feature of claim 7 of EP 1059372 A2 is "the crimp retention after stretching 10 times of at least 90%".

8) The constituent feature of claim 8 of EP 1059372 A2 is "the crimp retention after stretching 10 times of at least 95%".

In the method of producing a yarn according to EP 1059372 A2, the range of the producing conditions is ordinary in the technical field concerning a method of producing a polyester fiber. Moreover, as explained above, since the yarn according to the invention of EP 1059372 A2 is produced by the same method as disclosed in GB 1,075,689, the yarn is inevitably the same as that obtained in GB 1,075,689. That is, the yarns according to claims 6, 7 and 8 are the same as those disclosed in GB 1,075,689, and the yarn disclosed in GB 1,075,689 has at least 85%, 90% or 95% of crimp retention after stretching 10 times. Therefore, it is apparent that the constituent features of claims 6, 7 and 8 would be obvious to a person with ordinary skill in the art. Therefore, claims 6, 7 and 8 are not patentable.

9) The constituent feature of claim 9 of EP 1059372 A2 is "conjugate fibers having at least two polyester components".

GB 1,075,689 discloses in claim 1 "A helically crimpable composite filament comprising a laterally eccentric assembly of at least two synthetic polymeric components at least the first of which is a polyester...", and in Figs. 4, 5 and 6, conjugate fibers having at least two polyester components are disclosed. As explained above, the constituent feature of claim 9 is disclosed in GB 1,075,689.

Therefore, claim 9 is not patentable.

10) The constituent feature of claim 10 of EP 1059372 A2 is that "the conjugate fiber components are

dispersed eccentrically relative to one another in the cross-section of the fibers".

GB 1,075,689 discloses in claim 1 "A helically crimpable composite filament comprising a laterally eccentric assembly of at least two synthetic polymeric components at least the first of which is a polyester..." and in Figs. 4, 5 and 6 of GB 1,075,689, it is disclosed that the cross-sections of conjugate fibers have at least two polyester components which are dispersed eccentrically relative to one another in the cross-section of the fibers. As explained above, the constituent feature of claim 10 is disclosed in GB 1,075,689.

Therefore, claim 10 is not patentable. (claim 11) The constituent feature of claim 11 of EP 1059372 A2 is that "the ratio of the respective melt viscosities of the polyesters (highest to lowest) is from 1:1 to 1.5:12".

In the method of producing a yarn according to EP 1059372 A2, the range of the producing conditions is ordinary in the technical field concerning a method of producing a polyester fiber. Moreover, as explained above, since the yarn according to the invention of EP 1059372 A2 is produced by the same method as disclosed in GB 1,075,689, the yarn is inevitably the same as that obtained in GB 1,075,689. That is, the yarn according to claim 11 is the same as that disclosed in GB 1,075,689, and the yarn disclosed in GB 1,075,689 has from 1:1 to 1.5:12 of a ratio of the respective melt viscosities of the polyesters (highest to lowest). Therefore, it is apparent that the constituent feature of claim 11 would be obvious to a person with ordinary skill in the art.

Therefore, claim 11 is not patentable.

12) The constituent feature of claim 12 of EP 1059372 A2 is that "at least one component of the

conjugate fibers is PTT or PBT".

13) The constituent feature of claim 13 of EP 1059372 A2 is that "at least one component of the conjugate fibers is PTT".

14) The constituent feature of claim 14 of EP 1059372 A2 is that "the conjugate fibers comprise PTT and PET". GB 1,075,689 discloses in claim 1 "A helically crimpable composite filament comprising a laterally eccentric assembly of at least two synthetic polymeric components at least the first of which is a polyester..."; and, in claim 2, that "the said polyester is poly(trimethylene terephthalate)". Moreover, in Example XII, a PPT polymer and PET polymer are used, and in Example 7, a PBT polymer and PET polymer are used (see Table 2). As explained above, the constituent features of claims 12, 13 and 14 are disclosed in GB 1,075,689.

Therefore, claims 12, 13 and 14 are not patentable.

15) The constituent feature of claim 15 of EP 1059372 A2 is "a crimp stretch factor (E_0) when heat treated under no load of at least 45%".

In Example 11 of GB 1,075,689, the crimp stretch factors (E_0) when heat treated under no load of 46.2 to 69% (see Table 7). As explained above, the constituent feature of claim 15 is disclosed in GB 1,075,689.

Therefore, claim 15 is not patentable.

16) The constituent feature of claim 16 of EP 1059372 A2 is "a crimp stretch factor ($E_{3.5}$) when heat treated under a 3.5×10^{-3} cN/dtex (4 mgf/d) load of at least 10%".

In the method of producing a yarn according to EP 1059372 A2, the range of the producing conditions is ordinary in the technical field concerning a method of producing a polyester fiber. Moreover, as explained above,

since the yarn according to the invention of EP 1059372 A2 is produced by the same method as disclosed in GB 1,075,689, the yarn is inevitably the same as that obtained in GB 1,075,689. That is, the yarn according to claim 16 is the same as that disclosed in GB 1,075,689, and the yarn disclosed in GB 1,075,689 has a crimp stretch factor (E_{cs}) when heat treated under a 3.5×10^{-3} cN/dtex (4 mgf/d) load of at least 10%. Therefore, it is apparent that the constituent feature of claim 16 would be obvious to a person with ordinary skill in the art.

Therefore, claim 16 is not patentable.

17) Claim 26 of EP 1059372 A2 relates to a combined yarn which is characterized in that the yarn has, in combination, a yarn component which is a yarn according to claim 1 and yarn component which is a low shrinkage yarn of boiling water shrinkage no more than 10%.

Example XXV of US 3,671,379 discloses a yarn which is combined a composite yarn comprising PPT and PET with a commercially available polyester staple at a ratio of 50/50 (see column 23, lines 30 to 55). The commercially available polyester staple has apparently no more than 10% of boiling water shrinkage. Therefore, the yarn according to claim 26 is disclosed in US 3,671,379.

Therefore, claim 26 is not patentable.

18) The constituent feature of claim 27 of EP 1059372 A2 is "a high twist coefficient of at least 5000". In the method of producing a yarn according to EP 1059372 A2, the range of the producing conditions is ordinary in the technical field concerning a method of producing a polyester fiber. Moreover, as explained above, since the yarn according to the invention of EP 1059372 A2 is produced by the same method as disclosed in GB 1,075,689, the yarn is inevitably the same as that obtained in GB 1,075,689. For example, since a twist coefficient of 7500 to 25000 is

disclosed in JP 5-295670 (see claim 1), a high twist coefficient of at least 5000 can be easily conceived by a person with ordinary skill in the art.

As explained above, it is apparent that the constituent feature of claim 27 would be obvious to a person with ordinary skill in the art. Therefore, claim 27 is not patentable.

19) The constituent feature of claim 28 of EP 1059372 A2 is "a fabric using at least a yarn according to any one of claims 1 to 16".

20) The constituent feature of claim 29 of EP 1059372 A2 is that "a fabric contains a yarn according to any one of claims 1 to 16 at least as a component of a combined yarn".

21) The constituent feature of claim 30 of EP 1059372 A2 is that "a fabric contains, as an entire yarn, a yarn according to any one of claims 1 to 16".

US 3,671,379 discloses that "It still further provides aesthetically pleasing fabric structures comprising such filaments..." (see column 2, lines 52 to 55). Moreover, there are many Examples in US 3,671,379 (see Examples XV, XVII, XVIII and XIX). Therefore, the constituent features of claims 28, 29 and 30 are disclosed in US 3,671,379 or could be easily conceived of by a person with ordinary skill in the art from the description in US 3,671,379.

Therefore, claims 28, 29 and 30 are not patentable.

22) The constituent feature of claim 31 of EP 1059372 A2 is that "a fabric additionally contains natural and/or semi-synthetic fibers".

23) The constituent feature of claim 32 of EP 1059372 A2 is "a fabric wherein the natural and/or semi-synthetic fibers are present as a component yarn in a combined yarn in which the other component is a yarn".

according to any one of claims 1 to 16".

24) The constituent feature of claim 33 of EP 1059372 A2 is that "a fabric contains respective separate yarns according to any one of claims 1 to 16 and yarns of natural and/or semi-synthetic fibers".

US 3,671,379 discloses a fabric additionally containing natural and/or semi-synthetic fibers. For example, the fabrics comprising wool and a composite fiber are disclosed (see Examples XX, XXI and XXII). Therefore, the constituent features of claims 31, 32 and 33 are disclosed in US 3,671,379 or could be easily conceived of by a person with ordinary skill in the art from the description in US 3,671,379.

Therefore, claims 31, 32 and 33 are not patentable.

5. Conclusion

As explained above, all of the claims of EP 1059372 A2 lack novelty or inventive step over the prior arts.

Therefore, EP 1059372 A2 should not be patented.